

42. Notes on the Feeding of Snakes in Captivity.
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Some years ago, in a paper contributed to the 'Proceedings' of the Society by Dr. Chalmers Mitchell and Mr. R. I. Pocock, entitled "The Feeding of Reptiles in Captivity" (P. Z. S. 1907, p. 785), a general account was given of the feeding habits of the Snakes then living in the Gardens, together with records of a large number of individual specimens, showing the amount consumed between the months of May and October. My own general observations tally with those of Dr. Mitchell and Mr. Pocock, and my object in presenting this paper is to lay before the Society some additional facts, to show how unnecessary it is to feed the snakes on live creatures, and to give a detailed record of the amount taken and of the regularity of the meals in a number of specimens over a period of a year.

Previous to my appointment at the Gardens I had fed the few snakes kept by me on live animals, being under the influence of the popular belief either that many snakes would not take dead food at all, or that, at any rate, in most cases much time had to be spent in inducing them to do so. On taking over the charge of the reptiles here, I confess I was surprised to find how readily they accepted dead prey. I was nevertheless of opinion that some individuals would not accept dead food under any circumstances, and I therefore asked and obtained the Secretary's permission to offer live food in certain cases where dead had been persistently refused. From the summer of 1911 up to that of 1915, living prey was offered to nine snakes that had refused the dead as food. The results given below are, I think, convincing, showing that, with possible rare exceptions, a snake that refuses to feed on dead animals is not more likely to accept these if alive.

1. ANACONDA (*Eunectes murinus*).

This snake, a large specimen, 16 feet in length, refused dead food for the first eight months of its captivity. A live duck was offered on two occasions in the course of the first fortnight of the 9th month, but was refused on both. The third week it was once more given dead food, and this was accepted. It has since fed with the greatest regularity on dead chickens and ducks, consuming on an average one a fortnight.

2. RETICULATED PYTHON (*Python reticulatus*).

This, a very large snake measuring 24 ft., had fed since its arrival in 1898 with some regularity on dead kids and ducks. In August 1911 it broke its jaw in the process of swallowing a

kid. The jaw was set in plaster of Paris, and the setting was removed a month later. After the accident it refused to feed, and in November it was decided to tempt it with something alive. Live ducks were offered on two occasions in November, but were not taken. In the first week of December it was once more given dead food—a duck, which was immediately accepted. The snake unfortunately died a few weeks later.

3. COMMON BOA (*Boa constrictor*).

This snake, measuring 7 ft., was presented to the Society in July 1912. It had been kept in captivity some time before its arrival here, and been fed on live food only. For the first two months of its captivity at the Gardens it was offered dead rats, rabbits, and pigeons, all of which were refused. As it had previously fed well on live animals it was, in September and October, offered such, but they were not taken. In November dead food was again offered and this time accepted, the snake feeding henceforth with some regularity up to June 1913, when pneumonia caused its death.

4. SOUTH-AFRICAN HOUSE-SNAKE (*Boodon infernalis*).

This snake had been kept by me for two years previous to my taking over the charge of the reptiles here. It had been fed on live mice. On its transference to our Gardens it at once took dead food.

5. PUFF ADDER (*Bitis arietans*).

Received in June 1911, this snake fed with some regularity on dead rats up to the end of December. For the first six months of 1912, however, it refused food, and as it was getting thin we decided in June of that year to let it have live food. Live rats were accepted during part of June, July, and August, and part of September. Towards the end of the latter month, dead food was substituted and taken, the snake feeding on dead rats to within a week of its death in January 1914.

6. BUSHMASTER (*Lachesis mutus*).

This snake was presented to the Society in December 1912. As I had been informed by Mr. Mole, of Trinidad, who had experience of this species, that it had never been induced to take dead prey, after offering it dead rats for three consecutive weeks, I obtained the permission to give it live food. The live rats were, however, likewise rejected, and the snake died in March of starvation.

7. BUSHMASTER (*Lachesis mutus*).

This specimen, received in April 1913, was likewise offered living animals after refusing dead food for some weeks. It also refused to feed at all, and died in September.

8. CROSSED VIPER (*Lachesis alternatus*).

This snake, received in April 1914, was offered living food after having refused dead prey for fifteen months. The live mice were accepted, but unfortunately the snake died shortly after its meal.

9. TEXAS RATTLESNAKE (*Crotalus atrox*).

The snake, acquired in June 1909, fed from time to time upon dead animals up to June 1911. Having refused food from then up to September, and as it was becoming emaciated, in the first week of September it was offered live rats, which were refused. The following week it fed on three dead mice. From that day to its death in January 1912 it refused all food whether live or dead.

10. TEXAS RATTLESNAKE (*Crotalus atrox*).

As this snake, which was received in May 1912, refused dead food for the first six weeks of its captivity, it was decided to give it living animals, and it was offered live rats during the month of July. It, however, refused both the live and the dead food, and died in September.

Although a number of persons with much experience in keeping these reptiles in captivity, have been unsuccessful in inducing their specimens to accept dead prey, the above records, I think, prove that, in our Gardens, at least, it is quite unnecessary to give any snakes live food, as out of about 300 snakes kept here during the period covering these observations, with the exception of the Crossed Viper which died shortly after its meal, not a single snake would feed on live animals only, and in four cases dead food was accepted after the live prey had been refused.

A point greatly in favour of giving dead animals to the snakes lies in the possibility of examining the former for tubercle. Up to the month of June 1910 the animals intended for the snakes were not examined. At the suggestion, however, of Professor Plimmer, the Society's Pathologist, from that date onwards the food has been carefully inspected and about 5 per cent. condemned, with the result that tubercle in snakes which prior to June 1910, accounted for 14 per cent. of the deaths, has been reduced to just over 3 per cent. In the years 1908, 1909, and the first half of 1910, before the inauguration of the new system, 33 snakes in all died of tubercle, while since the examination of the food, *i. e.* the second half of 1910, and the years 1911, 1912, 1913, 1914, and the first half of 1915, there have been 23 cases only.

It is generally believed that if snakes will take dead animals these have to be quite freshly killed and warm. Such is, however, not the case, for, as has been pointed out by Dr. Chalmers Mitchell and Mr. Pocock, the prey is frequently not taken until long after it has been introduced into the cages.

As an instance of this, it is, I think, worth recording that one of our large Indian Pythons on one occasion did not take a rabbit which had been given it at 4 o'clock on a winter's afternoon, until 9 o'clock next morning, when, as was only to be expected after 17 hours in a temperature of nearly 80°, it was in an almost putrid condition.

Another point of peculiar interest is that while tame rats are acceptable to a large number of the snakes, wild rats are seldom taken, and even when accepted are not digested but brought up again a few days later. That this should be the case with rats caught outside the Gardens is understandable, but the wild rats I refer to are those caught in the Gardens and are therefore, living as they do on the remnants of the food provided for the exhibits, comparatively clean feeders.

The experience of Mr. H. N. Ridley who, writing of the pythons in the Botanical Gardens in Singapore, stated that small specimens fed about once a month, large ones once in six to nine months, did not coincide with that of Dr. Mitchell and Mr. Pocock, who recorded the fact that the majority of specimens fed with the greatest regularity during the summer months, some only refusing food when about to shed their skins. As may be seen below, my experience with the large snakes likewise differs from that of Mr. Ridley: two large specimens feeding on as many as thirty occasions during the year, the longest period of fasting amounting to just over a month; while of the smaller specimens it will be noted that a Boa which did not fast for a longer period than three weeks, fed on thirty-five occasions in the course of a year.

The table on p. 587 gives a detailed record of the feeding of a number of healthy specimens over a period of one year.

Name.	No. of Times Fed.	Longest Period of Fast.	Total Amount taken.
Reticulated Python (<i>Python reticulatus</i>)	30	5 weeks.	16 kids, 17 ducks.
" "	26	4 "	30 chickens, 3 ducks, 1 rabbit.
" "	32	4 "	31 ducks, 8 pigeons, 3 rabbits.
Indian Python (<i>Python molurus</i>)	20	6 "	15 pigeons, 14 rabbits.
" "	13	13 "	13 pigeons, 1 large rat.
African Python (<i>Python sebae</i>)	29	6 "	1 pigeon, 92 rats, 6 sparrows.
Anaconda (<i>Eunectes murinus</i>)	24	4 "	24 chickens.
Common Boa (<i>Boa constrictor</i>)	35	3 "	23 rabbits, 13 pigeons, 2 large rats.
" "	14	9 "	11 pigeons, 8 rabbits, 3 large rats.
" "	17	7 "	33 large rats.
Indian Burrowing Boa (<i>Bryce johni</i>)	15	8 "	30 small rats.
Mole Snake (<i>Pseudaspis cana</i>)	36	3 "	38 rats.
*Malay Water-Snake (<i>Aerobochilus javanicus</i>)	25	"	84 small fish.
*Indian River-Snake (<i>Tropidonotus piscator</i>)	40	"	200 small fish.
*Sharp-nosed Snake (<i>Triocheilodon madagascariensis</i>)	40	"	120 rats.
*False Moccasin (<i>Tropidonotus fasciatus</i>)	40	"	160 frogs.
Indian Rat-Snake (<i>Zamenis mucosus</i>)	23	4 "	39 rats.
Cornis Snake (<i>Coluber corais</i>)	21	5 "	76 rats.
Chicken Snake (<i>Coluber obsoleteus</i>)	18	7 "	21 mice, 6 sparrows.
Four-lined Snake (<i>Coluber quatuorlineatus</i>)	15	6 "	27 mice.
Bull Snake (<i>Coluber melanoleucus</i>)	37	4 "	139 rats.
Smooth Snake (<i>Coronella levis</i>)	5	16 "	5 lizards.
*King Snake (<i>Coronella gabita</i>)	40	"	160 mice.
*Indian Cobra (<i>Naja brypadans</i>)	30	"	90 mice.
Black and White Cobra (<i>Naja melanoleuca</i>)	41	2 "	33 small rats, 147 mice, 2 sparrows.
Black-collared Cobra (<i>Naja nigricollis</i>)	36	3 "	51 small rats, 58 mice, 8 sparrows.
Night Adder (<i>Causus rhombatus</i>)	44	2 "	203 small frogs.
Russell's Viper (<i>Vipera russelli</i>)	19	4 "	32 small rats.
Gaboon Viper (<i>Bitis gabonica</i>)	9	12 "	9 pigeons.
" "	16	7 "	10 rats, 8 sparrows.
Puff Adder (<i>Bitis arietans</i>)	32	7 "	111 rats.
Green Viper (<i>Atheris chlorocinctis</i>)	10	11 "	20 small frogs, 2 lizards.
Per-de-Lance (<i>Lachesis lanceolata</i>)	14	9 "	22 rats.

* In the above a number of specimens were kept together in the same cage, and it was impossible to give exact individual records. Only an average has therefore been given.